

ABSTRACT OF THE DISCLOSURE

A system and method for measuring the value of a parameter, e.g. sound energy, at a plurality of spaced locations using electrically powered microcells positioned at each of the locations and for transmitting RF signals commensurate with control and measurement data between a control node and the microcells, all without physical connection of a wiring harness, or the like, for either powering or signaling. The microcells and control node are mounted to an elongated, tubular member through which a single, insulated conductor and a coaxial cable in coupled mode extend, in proximity to the spaced microcells. The insulated conductor is connected to a source of AC power and passes through the open centers of current transformers which inductively couple the AC power to each microcell. A phase locked loop at each microcell controls the frequency of the AC power provided to the sensing element, thereby controlling the sampling rate. Signals are transmitted by the control node and carried by the coaxial cable and are received by appropriate RF equipment at each microcell to identify such things as the identity of the particular microcell being interrogated, packet size, data rates, acoustic data, etc. A federated radio system at the microcells transmits the requested data for reception at the control node and relay to an end user. This approach permits the supply of power, control of sampling rates and transfer of data in an essentially connectionless manner, thereby obviating many of the failures typically experienced with prior systems.